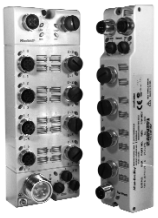
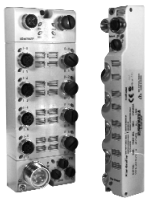
On-Machine Distributed I/O

Quick Selection Guide

	 1732 ArmorBlock and 1732D/E Armor WeldBlock I/O	 1732DS ArmorBlock Guard I/O	 1738 ArmorPoint I/O
I/O Types	Digital 24V DC	Digital 24V DC	Digital, Analog, AC, DC, Relay, Thermocouple, RTD
Module Density	8 or 16 points per block	8 or 16 points per block	2 to 8 points per module
Specialty Modules	Dual-port EtherNet/IP, configured as embedded switch	—	• 30 types • Serial Synchronous Interface (SSI) • Very High Speed Counter • RS232 • RS485 • Incremental Encoder • Extension cables for I/O and ArmorStart
Network Connectivity	DeviceNet, EtherNet/IP, PROFIBUS DP	DeviceNet	DeviceNet (including SubNet connectivity), ControlNet, EtherNet/IP, PROFIBUS DP
Environmental Style	IP69K, NEMA 4X	IP67	IP69K, IP67 (AC)
Max. Modules per Node	1 block	1 block	Up to 63 modules
Additional Information	• See page page 10-3	• See page page 10-10	• See page page 10-13

For product certification information go to http://www.ab.com/certification.



Description

The 1732 ArmorBlock® I/O family features space-saving, inexpensive, sealed-housing digital I/O blocks suitable for On-Machine™ mounting. 1732 ArmorBlock I/O is available for DeviceNet™, EtherNet/IP™, and PROFIBUS™ communication networks. Armor™ WeldBlock I/O modules are suited for use in typical welding applications. Up to sixteen 24V DC points can be addressed per node. A secondary enclosure is not necessary to house these modules.

Features

- Sealed housing rated for IP69K and NEMA 4X eliminate enclosure costs
- Low installation cost and easy to replace without rewiring because industry-standard mini or M12 DC micro connectors are used for connection to the DeviceNet network and auxiliary power supply. I/O connectors are sealed M8 pico or M12 DC micro styles
- 8 and 16 point self-configuring I/O allows the input/output mix to a granularity of one
- Dual-port EtherNet/IP, configured as an embedded switch, supports star, tree, linear, and ring topologies
- Isolated auxiliary power maintains power to the outputs if the main power fails so that you can have the option of holding outputs in their last state
- Outputs electronically protected
- Complies with Open DeviceNet Vendor Association, Inc. (ODVA) conformance test software

Product Design

The 1732 ArmorBlock I/O modules have a compact style with a low profile. The 1732 ArmorBlock modules are packaged in a sealed housing rated for IP67, IP69K, and NEMA 4X. A 1732 ArmorBlock I/O module contains digital I/O circuits, a built-in power supply, and a built-in DeviceNet, EtherNet/IP, or PROFIBUS DP I/O adapter. Dual-port EtherNet/IP modules contain Stratix-compatible embedded switch technology. The DeviceNet network supplies power to the ArmorBlock system and, on some models, also to the I/O. On those units with DeviceNet network powered I/O, a diagnostic bit is provided for short circuits and overcurrent. Inputs and outputs are powered by an external 24V DC source which is independent of the network. An external 24V DC power source is required for PROFIBUS DP.

I/O blocks are available with 8 or 16 I/O points. Electronic fusing provides protection for output load devices and easy resetting. Units are available as 8 or 16 inputs, 8 or 16 outputs, or 8 or 16 self-configuring modules. The self-configuring modules contain both input and output functionality. With these self-configuring modules, it's not required to “configure” anything and any combination of input and outputs are available (for example, 7+1, 11+5, 4+4). The self-configuring units have automatic output monitoring.

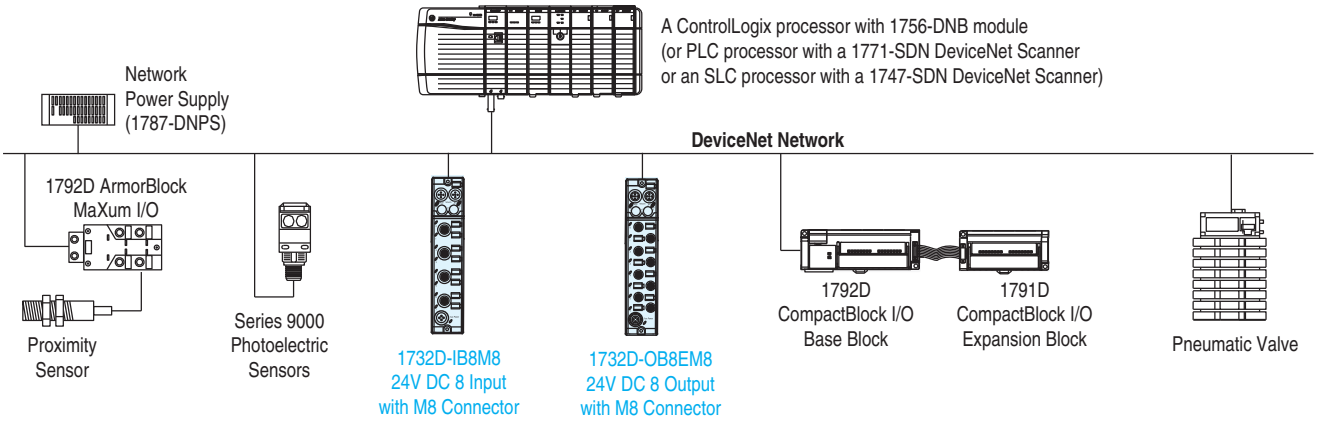
The 1732 ArmorBlock I/O modules are designed for back-panel or On-Machine mounting. The 8-point modules can be front or side mounted, the 8- or 16-point modules can be horizontally or vertically mounted. Enclosure costs are eliminated because each block is packaged in a rated sealed housing. I/O terminations are DC micro (M12) quick-disconnects or pico (M8) quick-disconnects. These modules do not require a separate base.

Armor WeldBlock Product Design

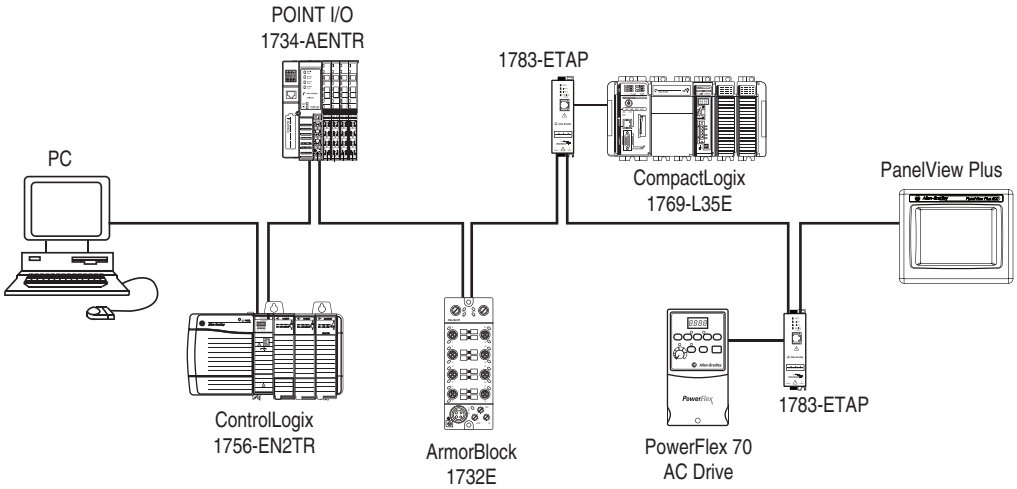
The 1732 Armor WeldBlock is designed for use in typical welding applications. The design resists the effects of weld slag and magnetic fields found in close proximity to the weld head. The sealed, light-weight metal housing of nickel-plated aluminum, protects the electronics, which are the same as those in other 1732 ArmorBlocks. This is ideal for end-of-arm robot applications. Armor WeldBlocks are available in DeviceNet and EtherNet/IP with 24V DC, 16-point inputs only, or 16-point self-configuring I/O. I/O and network connections are DC Micro (M12).

Typical Configuration

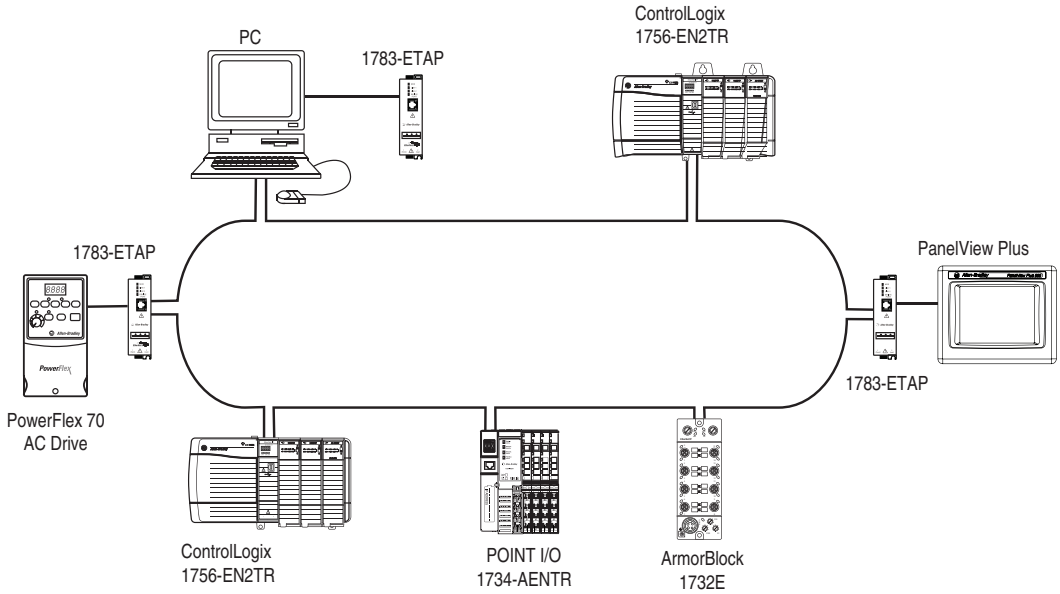
DeviceNet Communication



EtherNet Linear Network



EtherNet Device Level Ring Network



General Specifications

Enclosure Type Rating	Meets IP65/66/67/69K (when marked), and NEMA 4X/6P with recepticle dust caps or cable termination and NEMA 4X
Mounting Type	On-Machine, Panel
Operating temperature	-20…60 °C (-4…140 °F)
Nonoperating temperature	-40…85 °C (-40…185 °F)
Relative humidity	5...95% noncondensing
Operating shock	30 g
Nonoperating shock	50 g
Vibration	5 g at 10…500 Hz
Certifications✶	c-UL-us, CE, C-Tick, EtherNet/IP, ODVA

✶ When product is marked, see the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Dimensions and Weights

Description	Dimensions (HxWxD), Approx.	Weight
8-point ArmorBlock I/O Modules	179 x 37 x 43.25 mm (7.05 x 1.46 x 1.70 in)	0.20 kg (0.45 lb)
16-point ArmorBlock I/O Modules	179 x 65 x 43.25 mm (7.05 x 2.56 x 1.70 in)	0.34 kg (0.75 lb)

ArmorBlock Digital I/O Blocks

DeviceNet Digital I/O Blocks

DeviceNet, 24V DC, 8 and 16 Point

Cat. No.	Inputs (Sink)	Outputs (Source)	Max. Continuous Output Current Rating per Point/Module	Max. Surge/Inrush Output Current Rating per Point	Max. Current for Input Device Power per Point	Potential Max. Aux. Current per Module	Network Current Draw	I/O Connectors
1732D-IB8M8	8 Sink	0	—	—	0.8 A	0.45 A	100 mA	(8) M8
1732D-IB8M12								(4) M12
1732D-OB8EM8	0	8 Source	0.5/4.0 A	1.2 A	—	4.0 A	100 mA	(8) M8
1732D-OB8EM12								(4) M12
1732D-8CFGM8	8 self-configuring ‡		0.5/4.0 A	1.2 A	0.8 A	4.0 A	100 mA	(8) M8
1732D-8CFGM12								(4) M12
1732D-IB16M12M12	16 Sink	0	—	—	0.8 A	0.9 A	75 mA	(8) M12
1732D-IB16M12MINI								
1732D-OB16M12M12	0	16 Source✶	2.0/8.0 A✶	4.8 A	—	0.1/8.0 A❄	100 mA	(8) M12
1732D-OB16M12MINI								
1732D-16CFGM12M12	16 self-configuring ‡		0.5/8.0 A	1.2 A	0.8 A	0.9/8.0 A	100 mA	(8) M12
1732D-16CFGM12MN								

✶ Maximum current on all I/O connectors exceeds total for the module.
❄ Module operation power and input device power, from Auxiliary Power Connector pins 2 and 3, are separate and isolated from the I/O output power, from Auxiliary Power Connector pins 1 and 4. Both auxiliary power consumption totals need to be noted.
‡ Each of the self-configuring I/O points can be either an input (sink) or an output (source), for example: 16 points: 13 in –3 out, 6 in – 10 out, etc. or 8 points: 6 in – 2 out, 1 in – 7 out, etc.

DeviceNet Digital I/O Blocks with Network Powered I/O and Diagnostics

I/O diagnostics provide one fault bit per modules to indicate a short circuit or overcurrent on any I/O point. Inputs and/or outputs powered by network where noted.

DeviceNet, 24V DC, 16 Point

Cat. No.	Inputs (Sink) Powered by Network	Outputs (Source)	Max. Continuous Output Current Rating per Point/Module	Max. Surge/Inrush Output Current Rating per Point	Max. Current for Input Device Power per Point	Potential Max. Aux. Current per Module	Max. Network Current Draw for Module Operation Plus I/O	I/O Connectors
1732D-8X81212D	8 (2 each on 4 connectors)	8 (2 each on 4 connectors)	0.5/4.0 A	1.2 A	0.8 A	4.0 A	0.1 A + I/O (1.0 A max.)	(8) M12
1732D-8X81212HD	8 (2 each on 4 connectors)	8 (2 each on 4 connectors)	1.4/8.0 A∗	3.1 A	0.8 A	8.0 A	0.1 A + I/O (1.0 A max.)	(8) M12
1732D-8I8O1212D	8 (1 on each connector)	8 (1 on each connector and powered by network)	0.5/4.0 A	1.2 A	0.8 A	—	0.1 A + I/O (5.0 A max.)	(8) M12
1732D-IB161212D	16 powered by network	0	—	—	0.8 A	—	75 mA + I/O (0.95 A max.)	(8) M12

∗ Maximum current on all I/O connectors exceeds total for the module.

EtherNet/IP Digital I/O Blocks

EtherNet/IP, 24V DC, 8 and 16 Point

Cat. No.	Inputs (Sink)	Outputs (Source)	Max. Continuous Output Current Rating per Point/Module	Max. Surge/Inrush Output Current Rating per Point	Max. Current for Input Device Power per Point	Potential Max. Aux. Current per Module §	I/O Connectors	Dual-port Support
1732E-IB16M12	16	0	—	—	5 mA at 30V DC	8.0 A	(8) M12	—
1732E-IB16M12DR	16 inputs with diagnostics	0	—	—	5 mA at 30V DC	8.0 A	(8) M12	2 EtherNet/IP ports♣
1732E-IB16M12R	16	0	—	—	5 mA at 30V DC	8.0 A	(8) M12	2 EtherNet/IP ports♣
1732E-IB16M12SOEDR	16 sequence of events inputs with diagnostics	0	—	—	5 mA at 30V DC	8.0 A	(8) M12	2 EtherNet/IP ports♣
1732E-OB16M12	0	16	2.0 A/8.0 A ∗	4.8 A for 10 ms, repeatable every 2 s	—	8.0 A	(8) M12	—
1732E-OB16M12DR	0	16 outputs with diagnostics	0.5 A/8.0 A	1.2 A for 10 ms, repeatable every 2 s	—	8.0 A	(8) M12	2 EtherNet/IP ports♣
1732E-OB16M12R	0	16	2.0 A/8.0 A ∗	4.8 A for 10 ms, repeatable every 2 s	—	8.0 A	(8) M12	2 EtherNet/IP ports♣
1732E-8X8M12DR	8 inputs with diagnostics	8 outputs with diagnostics	0.5 A/4.0 A	1.2 A for 10 ms, repeatable every 2 s	5 mA at 30V DC	4.0 A	(8) M12	2 EtherNet/IP ports♣
1732E-16CFGM12	16 self-configuring ‡		0.5 A/8.0 A	1.2 A for 10 ms, repeatable every 2 s	5 mA at 30V DC	8.0 A	(8) M12	—
1732E-16CFGM12R	16 self-configuring ‡		0.5 A/8.0 A	1.2 A for 10 ms, repeatable every 2 s	5 mA at 30V DC	8.0 A	(8) M12	2 EtherNet/IP ports♣

∗ Maximum current on all I/O connectors exceeds total for the module.
§ Pins 2, 3 for sensor source and module powe plus pins 1, 4 for output loads.
‡ Each of the self-configuring I/O points can be either an input (sink) or an output (source), for example: 16 points: 13 in –3 out, 6 in – 10 out, etc.
♣ Configured as embedded switch. Supports star, tree, linear, and ring topologies.

PROFIBUS DP Digital I/O Blocks

PROFIBUS DP, 24V DC, 8 and 16 Point

Cat. No.	Inputs (Sink)	Outputs (Source)	Max. Continuous Output Current Rating per Point/Module	Max. Surge/Inrush Output Current Rating per Point	Max. Current for Input Device Power per Point	Potential Max. Aux. Current per Module	I/O Connectors
1732P-IB8M8	8 Sink	0	—	—	0.8 A	0.45 A	(8) M8
1732P-IB8M12							(4) M12
1732P-OB8EM8	0	8 Source	0.5/4.0 A	1.2 A	—	4.0 A	(8) M8
1732P-OB8EM12							(4) M12
1732P-8CFGM8	8 self-configuring ‡		0.5/4.0 A	1.2 A	0.8 A	4.0 A	(8) M8
1732P-8CFGM12							(4) M12
1732P-IB16M12	16 Sink	0	—	—	0.8 A	1.0 A	(8) M12
1732P-OB16M12	0	16 Source∗	2.0/8.0 A∗	4.8 A	—	0.2/8.0 A❄	(8) M12
1732P-16CFGM12	16 self-configuring ‡		0.5/8.0 A	1.2 A	0.8 A	1.0/8.0 A❄	(8) M12

∗ Maximum current on all I/O connectors exceeds total for the module.
❄ Module operation power and input device power, from Auxiliary Power Connector pins 2 and 3, are separate and isolated from the I/O output power, from Auxiliary Power Connector pins 1 and 4. Both auxiliary power consumption totals need to be noted.
‡ Each of the self-configuring I/O points can be either an input (sink) or an output (source), for example: 16 points: 13 in –3 out, 6 in – 10 out, etc. or 8 points: 6 in – 2 out, 1 in – 7 out, etc.

Armor WeldBlock Digital I/O Blocks

DeviceNet WeldBlocks, 24V DC, 16 Point

Cat. No.	Inputs (Sink) Powered by Network	Outputs (Source)	Max. Continuous Output Current Rating per Point/Module	Max. Surge/Inrush Output Current Rating per Point	Max. Current for Input Device Power per Point	Potential Max. Aux. Current per Module	Network Current Draw	I/O Connectors
1732D-IB161212W	16 Sink	0	—	—	0.8 A	0.9 A	75 mA	(8) M12
1732D-16CFG1212W	16 self-configuring‡		0.5/8.0 A	1.2 A	0.8 A	0.9/8.0 A❄	100 mA	(8) M12

❄ Module operation power and input device power, from Auxiliary Power Connector pins 2 and 3, are separate and isolated from the I/O output power, from Auxiliary Power Connector pins 1 and 4. Both auxiliary power consumption totals need to be noted.
‡ Each of the self-configuring I/O points can be either an input (sink) or an output (source), for example: 16 points: 13 in –3 out, 6 in – 10 out, etc. or 8 points: 6 in – 2 out, 1 in – 7 out, etc.

EtherNet/IP WeldBlocks, 24V DC, 16 Point

Cat. No.	Inputs (Sink) Powered by Network	Outputs (Source)	Max. Continuous Output Current Rating per Point/Module	Max. Surge/Inrush Output Current Rating per Point	Max. Current for Input Device Power per Point	Potential Max. Aux. Current per Module	I/O Connectors
1732E-IB16M12W	16 Sink	0	—	—	0.8 A	1.1 A	(8) M12
1732E-16CFGM12W	16 self-configuring‡		0.5/8.0 A	1.2 A	0.8 A	1.5/8.0 A❄	(8) M12

❄ Module operation power and input device power, from Auxiliary Power Connector pins 2 and 3, are separate and isolated from the I/O output power, from Auxiliary Power Connector pins 1 and 4. Both auxiliary power consumption totals need to be noted.
‡ Each of the self-configuring I/O points can be either an input (sink) or an output (source), for example: 16 points: 13 in –3 out, 6 in – 10 out, etc. or 8 points: 6 in – 2 out, 1 in – 7 out, etc.

Mating Cables

Mating Cables for ArmorBlock DeviceNet Digital I/O Modules

The mating cables shown represent straight PVC models. For additional configurations, materials, and specifications, consult the On-Machine Connectivity catalog, publication M116-CA001 http://literature.rockwellautomation.com/idc/groups/literature/documents/ca/m116-ca001_-en-p.pdf.

I/O Connections—DC Micro (M12) or Pico (M8)

ArmorBlock Cat. No.	End Device per Connector and Quantity	Recommended Patchcord or V-Cable (Double-ended)	Recommended Male Cordset or V-Cable (Single-ended)	Recommended Male Field Attachable Connector
1732D-IB8M8 1732D-0B8EM8 1732D-8CFGM8	(1) DC Micro	889D–F4ABP3M–*	889P–M3AB—‡	871A–TS3–PM
	(1) Pico 3-Pin	889P–F3ABPM–*		
	(1) Pico 4-Pin	889P–F4ABPM3–*		
1732D-IB8M12 1732D-OB8EM12 1732D-8CFGM12 1732D-IB16M12M12 1732D-IB16M12MINI 1732D-OB16M12M12 1732D-OB16M12MINI 1732D-16CFGM12M12 1732D-16CFGM12MN 1732D-8X81212D 1732D-8I8O1212D 1732D-8X81212HD 1732D-IB161212D	(2) DC Micro	879D–F4ACDM–*	879D–C3ACD4M–‡	871A–VS4–DM
	(2) Pico 3-Pin	879PZ–F3ABDM4–*		
	(2) Pico 4-Pin	879PZ–F4ABDM–*		
	(1) DC Micro	889D–F4ACDM–*	889P-M3AB—‡	871A–TS4–DM
	(1) Pico 3-Pin	889P–F3ABDM4–*		
	(1) Pico 4-Pin	889P–F4ABDM–*		

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

DeviceNet Network Connections—Mini or Micro (M12)

ArmorBlock Cat. No.	Network Connection	Flat Media	Thick Round	Thin Round
1732D-IB16M12MINI 1732D-OB16M12MINI 1732D-16CFGM12MN	Mini	1485K–P§F5–N5	1485R–P§N5–M5	1485R–P§D5–N5
All other 1732D	Micro	1485K–P§F5–R5	1485R–P§M5–R5	1485R–P§R5–D5

§ = length in meters (1, 2, 3, 4, 5, and 6 standard).

Auxiliary Power Connections—Mini or Micro (M12)

ArmorBlock Cat. No.	ArmorBlock Aux. Power Connector Style	Flat Media	Round Media	
		Auxiliary Power Flat Media Connection	Thick Round	Thin Round
1732D-IB8M12 1732D-0B8EM12 1732D-8CFGM12 1732D-IB8M8 1732D-0B8EM8 1732D-CFGM8	4-Pin DC Micro	889D–F2ACDM–K§	Cordset: 889D–F2AC–‡ Patchcord: 889D–F2AEN4M–D§	Cordset: 889D–F4AC–‡ Patchcord: 889D–F4ACDM–*
1732D-IB16M12M12 1732D-IB16M12MINI 1732D-OB16M12M12 1732D-OB16M12MINI 1732D-16CFGM12M12 1732D-16CFGM12MN 1732D-8X8M12M12D 1732D-8X8M12M12HD	4-Pin Mini	1485T–PIE4–C§N4	Cordset: 889N–F4AFC–✪F Patchcord: 889N–F4AFNM–*	Terminal Chamber: 871A–TS4–N1
1732D-8I8OM12M12D 1732D-IB16M12M12D	Not applicable, inputs/outputs powered by network			

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).
§ = length in meters (1, 2, 3, 4, 5, and 6 standard).
✪ = length in feet (6, 12, and 20 standard).

Mating Cables for ArmorBlock EtherNet/IP, PROFIBUS DP Digital I/O and Armor WeldBlock I/O Modules

The mating cables shown represent straight PVC models. For additional configurations, materials, and specifications, consult the On-Machine Connectivity catalog, publication M116-CA001 http://literature.rockwellautomation.com/idc/groups/literature/documents/ca/m116-ca001_-en-p.pdf.

I/O Mating Cables—DC Micro (M12) or Pico (M8)

ArmorBlock Cat. No.	End Device per Connector and Quantity	Recommended Patchcord or V-Cable (Double-ended)	Recommended Male Cordset or V-Cable (Single-ended)	Recommended Male Field Attachable Connector
All 1732E 1732D-IB16M12M12W 1732D-16CFGM12M12W 1732P-IB8M12 1732P-0B8EM12 1732P-8CFGM12 1732P-IB16M12 1732P-0B16M12 1732P-16CFGM12	(2) DC Micro	879D–F4ACDM–*	879D–C3ACD4M–‡	871A–VS4–DM
	(2) Pico 3-Pin	879PZ–F3ABDM4–*		
	(2) Pico 4-Pin	879PZ–F4ABDM–*		
	(1) DC Micro	889D–F4ACDM–*	889D–M4AC–‡	871A–TS4–DM
	(1) Pico 3-Pin	889P–F3ABDM4–*		
	(1) Pico 4-Pin	889P–F4ABDM–*		
1732P-IB8M8 1732P-0B8EM8 1732P-8CFGM8	(1) DC Micro	889D–F4ABP3M–*	889P–M3AB—‡	871A–TS3–PM
	(1) Pico 3-Pin	889P–F3ABPM–*		
	(1) Pico 4-Pin	889P–F4ABPM3–*		

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

Network Mating Cables—DeviceNet Micro, EtherNet M12, or PROFIBUS DP Micro

ArmorBlock Cat. No.	Network Connector Type	Flat Media	Thick Round	Thin Round
1732D-IB161212W 1732D-16CFG1212W	DeviceNet (Micro)	1485K–P✪F5–R5	1485R–P✪M5–R5	1485R–P✪R5–D5
All 1732E	EtherNet/IP (EtherNet M12)	—	—	1585D–M4DC–H
All 1732P	PROFIBUS DP Micro (reverse key M12)	—	—	—

✪ = length in feet (6, 12, and 20 standard).

Auxiliary Power Mating Cables—Mini or DC Micro (M12)

ArmorBlock Cat. No.	ArmorBlock Aux. Power Connector Style	Flat Media	Round Media	
		Auxiliary Power Flat Media Connection	Thick Round	Thin Round
All 1732E 1732D-IB16M12M12W 1732D-16CFGM12M12W 1732P-IB16M12 1732P-OB16M12 1732P-16CFGM12	4-Pin Mini	1485T–P1E4–C§–N4	Cordset: 889N–F4AFC–§ Patchcord: 889N–F4AFNM–*	Terminal Chamber: 871A–TS4–N1
1732P-IB8M8 1732P-IB8M12 1732P-0B8EM8 1732P-0B8EM12 1732P-8CFGM8 1732P-8CFGM12	4-Pin DC Micro	889D–F2ACDM–K*	Cordset: 889D–F4AC–‡ Patchcord: 889D–F2AEN4M–D*	Cordset: 889D–F4AC–‡ Patchcord: 889D–F4ACDM–*

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).
§ = length in meters (1, 2, 3, 4, 5, and 6 standard).

1732DS ArmorBlock Guard I/O

Description

ArmorBlock® Guard I/O™ provides all the advantages of traditional distributed I/O for safety systems, but has an IP64, IP65, or IP67 package (as marked on the product label) that can be mounted directly on your machine. On-machine safety I/O reduces wiring time and startup costs for safety controller applications by eliminating electrical boxes and simplifying cable installation. The ArmorBlock family provides industrially hardened I/O blocks that you can mount directly on equipment near sensors or actuators. Wiring the I/O to the sensors and actuators is easy using pre-wired quick disconnect cables.

You can use Guard I/O with any safety controller that communicates on DeviceNet using CIP Safety for the control and monitoring of safety circuits. Guard I/O detects circuit failures at each I/O point while providing detailed diagnostics directly to the controller. With CIP Safety, you can easily integrate safety and standard control systems by using safety and standard messages on the same wire.

The 1732DS ArmorBlock Guard I/O family consists of 24V DC digital I/O modules that communicate on DeviceNet networks. The I/O connectors are sealed M12 micro style while the network and auxiliary power connectors are sealed mini style. Plus, the ArmorBlock Guard I/O uses the same input and output M12 pin configuration as standard ArmorBlock and MaXum.

Features

- IP64, IP65, or IP67 rated for direct mounting on machine without an enclosure
  (rating is marked on the product label)
- Compact footprint
- Quick disconnect dual-channel M12 I/O connectors allow a single cable connected between ArmorBlock Guard I/O and a dual-channel safety device (See the following table of Allen-Bradley Guardmaster safety devices)
- TÜV certified as a system with GuardLogix, GuardPLC1600/1800, SmartGuard 600 controllers
- Supports both standard and safety control
- Supports single and dual-channel devices on inputs and outputs
- I/O point-level and other detailed fault diagnostics are available to the PLC or HMI with self-testing inputs and outputs
- EDS (RSNetWorx for DeviceNet) or RSLogix 5000 profile configuration
- Certified by TÜV and UL for Functional Safety up to SIL 3 according to IEC 61508, and PLe/Category 4, according to ISO 13849-1
- Additional standard solid-state outputs can be configured as pulse test sources, outputs for standard PLC control, 24V DC sources, or muting lamp control and monitoring

Specifications

Cat. No.	1732DS-IB8	1732DS-IB8XOBV4
Description	24V DC Input Module for DeviceNet Networks	24V DC Input/Output Module on DeviceNet Networks
Current Consumption	—	
I/O Operating voltage range	19.2V…28.8 V DC (24V DC, -20…+20%)	
Digital Inputs		
Number of Inputs	8 safety single-channel or 4 safety dual-channel	
Input Type	current sinking	
Voltage, On-State Input, Min.	11V DC	
Voltage, Off-State Input, Max.	5V DC	
Current, On-State Input, Min.	3.3 mA	
Digital Outputs		
Number of Outputs	—	4 safety solid-state
Output Type	—	dual channel, current sourcing/current sinking pair
Output Current Rating	—	2.0 A max per point 8 A total module at40 °C (104 °F) 6 A total module at 60 °C (140 °F)
Short Circuit Protection	—	Yes
Standard Pulse Test Outputs		
Number of Pulse Test Sources	8	
Pulse Test Output Current	0.7 A per point	
Short Circuit Protection	Yes	
General		
Operating temperature	-20°…+60°C (-4°C…+140°F)	
Relative humidity	10…95% non-condensing	
Vibration	0.76 mm @ 10…500 Hz	
Operating shock	30 g	
Enclosure Protection	IP64, IP65, or IP67 as marked on the product label	
Dimensions (HxWxD), Metric	179 x 70 x 68.7 mm∗	
Dimensions (HxWxD), Imperial	7.05 x 2.76 x 2.71 in∗	
Weight, Metric	600 g	
Weight, Imperial	1.2 lb	
Certifications❄	UL, CE, C-Tick, CSA, UL NRGF, ODVA Conformance, certified by TÜV for Functional Safety up to SIL 3 and PLe/Cat. 4	

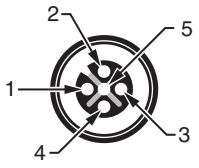
∗ Includes terminal block.
❄ When product is marked. See the Product Certification link at http://www.ab.com/certification for Declarations of Conformity, Certificates, and other certification details.
All specifications are subject to change. Refer to product installations instructions.

Safety Products that Connect Directly to ArmorBlock Guard I/O with a Single 5-Pin Micro (M12) Patchcord*

Product Family	Actuator Type	Cat. No. (with M12)	Catalog Page
Elf	Flat	440K-E2NNFPS	3-11
	Semi-flexible	440K-E2NNAPS	3-11
Cadet	Flat	440K-C2NNFPS	3-15
	Semi-flexible	440K-C2NNAPS	3-15
Trojan T15	Standard	440K-V2NNSPS	3-19
	Fully-flexible	440K-V2NNBPS	3-19
Trojan T15-GD2	GD2 Standard	440K-V2NNGPS	3-19
Trojan T5	Standard	440K-T2NBSPS	3-23
	Fully-flexible	440K-T2NBBPS	3-23
Trojan T5-GD2	GD2 Standard	440K-T2NBGPS	3-23
MT-GD2, Case Color Red with Snap-acting Contacts	None	440K-M2NBNDS	3-29
	None	440K-M2NANDS	3-29
MT-GD2, Case Color Yellow, Snap-acting Contacts	None	440K-M2NANYS	3-29
Sprite	Solid - 50xØ10 mm	440H-S2NNPPS	3-91
	Pre-bored - 30xØ16 mm	440H-S2NNHPS	3-91
Ensign	Solid - 50xØ10 mm	440H-E2NNPPS	3-95
	Pre-bored - 30xØ16 mm	440H-E2NNHPS	3-95
Lifeline3	N/A	440E-D2NNNYS	4-6
Lifeline4	N/A	440E-L2NNNYS	4-11
Emergency Stop	N/A	800F-1YMQ53V	4-43
Safety Mats	N/A	440F-MxxxHxNN	2-94

* Only the 2 N.C. safety contacts of the safety switches are connected to the 5-pin micro (M12) connector.

1732DS ArmorBlock Guard I/O Micro Connector Pin Assignments

Input Configuration			Output Configuration	
Pin	Signal	Female	Pin	Signal
1	Test Output n+1		1	Output +24V DC Power
2	Safe Input n+1		2	Output n+1 (Sinking)
3	Input Common		3	Output Power Common
4	Safe Input n		4	Output n (Sourcing)
5	Test Output n		5	Output Power Common

1732DS ArmorBlock Guard I/O Mini Connector Pin Assignments

ArmorBlock Guard I/O DeviceNet Configuration			
Pin	Signal	Male	Female
1	Drain		
2	V+ (Red)		
3	V- (Black)		
4	CAN_H (White)		
5	CAN_L (Blue)		

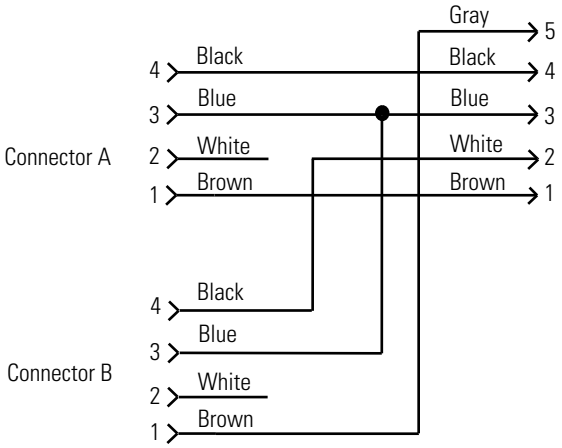
ArmorBlock Guard I/O Power Configuration		
Pin	Signal	Male
1	Output +24V DC Power (Red)	
2	Input +24V DC Power (Green)	
3	Input Power Common (White)	
4	Output Power Common (Black)	

ArmorBlock Guard I/O Recommended Compatible Cables and Connectors*

Description		Cat. No.
	DC Micro (M12) Male Cordset	889D-M5AC-❄
	Five-pin M12 patchcord, 1 m (39.37 in.)	889D-F5ACDM-‡
	DC Micro V-Cable for Single-Channel Sensors	879D-F4ACD5M-§
	M12 Single-Channel Splitter	879D-F4D5M
	M12 Terminal Chamber—Straight Male	871A-TS5-DM
	M12 Terminal Chamber—Right Angle Male	871A-TR5-DM

* All cables must use 5-pin connections for ArmorBlock Guard I/O M12 input compatibility.
❄ Replace symbol with 0M3 (0.3 m), 2 (2 m), or 5 (5 m) for standard cable length.
‡ Replace symbol with 1 (1 m), 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable length.
§ Replace symbol with 0M3 (0.3 m), 1 (1 m), 2 (2 m), or 5 (5 m) for standard cable length.

Single Channel Wiring (879D-F4ACD5M and 1485P-PID5-RR4)



ArmorPoint™ I/O

ArmorPoint is a 24V DC modular On-Machine™ I/O that extends the features and benefits of the POINT I/O™ IP20 system into an IP69K-compliant system. ArmorPoint I/O offers flexibility, ease of application, and just-what-you-need granularity in two to eight points to reduce system cost and size.

Features

- Sealed housing rated for IP69K and NEMA 4X eliminates enclosure costs.
- A variety of I/O types for broad application coverage.
- Easy module replacement with unique latching mechanisms eliminates need for screws.
- Connection with industry-standard M8, M12, and M23 quick-disconnects reduces costs of additional accessories.
- Provides tight IP67 motor starter integration with ArmorStart™.
- Extremely fast I/O backplane uses change-of-state (COS) connections to maximize performance (polling available in configuration mode).
- Auto Device Replacement (ADR) allows OEMs to add machine features and I/O modules without making changes to the machine's control software.
- Removal and Insertion Under Power (RIUP) makes it possible to replace a module without disrupting network operation.
- Efficient network solutions with multiple DeviceNet™ interfaces, ControlNet™, EtherNet/IP™, and PROFIBUS DP communication adapters.

Product Design

The architecture of ArmorPoint is based on the POINT I/O system and reuses the circuitry of the adapter and I/O designs. The system is IP67-compliant and meets other certifications necessary to provide a complete On-Machine solution. ArmorPoint I/O modules offer one to eight points per module. Choose from many different I/O types with connector choices of M8, M12, or M23 quick-disconnect terminations.

The I/O modules are interfaced to a network through a communication adapter, which includes a built-in power supply that converts incoming 24V DC power to 5V DC backplane power. Communication adapters are available for DeviceNet, ControlNet, EtherNet/IP, and PROFIBUS DP. The I/O modules receive power from the power supply through the backplane. ArmorPoint I/O offers flexibility, supporting up to 63 I/O modules per network node. A bus extension module allows for separation of modules on the same node.

The family includes hardened power supplies to allow for isolation, for example AC from DC, analog from digital, inputs from outputs. Module replacement is easy since modules are held on the base by unique latching mechanisms—no screws needed. ArmorPoint connects directly to ArmorStart™ on the same network node.

Modular Design

ArmorPoint I/O has three major components:

- **I/O modules** provide the field interface, system-interface circuitry, and bases for mounting
- **Communication interface modules** provide the network-interface circuitry
- **Power distribution modules** provide the solution to expandability of the ArmorPoint I/O system and the flexibility to mix a variety of signal types

Environmentals and Certifications

ArmorPoint I/O Modules Environmental Specifications

	ArmorPoint I/O Family
Enclosure Type Rating	Meets IP65/66/67/69K (when marked) and NEMA 4X∗
Mounting Type	On-Machine
Operating temperature	-20…60 °C (-4…140 °F)
Nonoperating temperature	-40…85 °C (-40…185 °F)
Relative humidity	5...95% noncondensing
Operating shock	30 g
1738-OW4M12, 1738-OW4M12AC	15 g
Nonoperating shock	50 g
Vibration	5 g at 10…500 Hz
1738-OW4M12, 1738-OW4M12AC	2 g at 10…500 Hz

∗ Except AC I/O modules, which are IP67.
❄ When product is marked. See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

AmorPoint I/O Approximate Dimensions

Module Type	Dimensions (HxWxD), Approx.
I/O Modules	120 x 72 x 42 mm∗ (4.72 x 2.83 x 1.65 in.∗)
Communication Adapter Modules (except for 1738-AENTR)	112 x 72 x 65 mm (4.41 x 2.83 x 2.56 in.)
2-Port EtherNet/IP Communication Adapter Module - 1738-AENTR	112 x 123 x 67 mm (4.41 x 4.84 x 2.64 in.)

∗ Includes I/O module and mounting base.

POINT I/O Modules Certifications

Certifications: CE, C-Tick.

When product is marked. See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Communication Adapter Modules

An ArmorPoint I/O communication interface module provides the interface between a network and the ArmorPoint I/O backplane. A terminating base, used with the last I/O module, ships with the adapter. An I/O adapter supports up to a maximum of 63 I/O modules.

Adapter modules are available for ControlNet, DeviceNet (with and without subnet connectivity), EtherNet/IP, or PROFIBUS DP networks. The DeviceNet adapters are available in four styles, based on connectivity: DC micro (M12) terminations, mini passthrough terminations, mini drop termination, and adapter with subnet connectivity.

ArmorPoint I/O Communication Adapters

Cat. No.	Description	Termination Type	Supports Expansion Power Supplies	Number of I/O Points, Max.*
		DeviceNet		
1738-ADN12	**DeviceNet I/O Adapter** • A total of 63 ArmorPoint I/O modules can be assembled on a single DeviceNet node	M12 Quick-Disconnect	Yes	252
1738-ADN18		Mini Connector - Drop		
1738-ADN18P		Mini Connector - Pass-through		
1738-ADNX	**DeviceNet I/O Adapter with Expansion Port** • A total of 63 ArmorPoint I/O modules can be assembled on a single DeviceNet node • Expansion network port allows for a DeviceNet subnet • Increases the reach of DeviceNet from 500 to 1500 meters • Increases nodes per DeviceNet scanner from 63 to more than 126 (dependent on DeviceNet scanner capacity)	M12 Quick-Disconnect	Yes	252
		ControlNet		
1738-ACNR	**ControlNet I/O Adapter** • A total of 63 ArmorPoint I/O modules can be assembled on a single ControlNet node • Up to 25 direct connections and 5 rack connections are allowed	TNC Connector	Yes	252
		EtherNet/IP		
1738-AENT	**EtherNet/IP Twisted Pair Media I/O Adapter** • A total of 63 ArmorPoint I/O modules can be assembled on a single EtherNet/IP node • Refer to the User Manual to determine the ratings for direct and rack connections allowed	M12 Quick-Disconnect	Yes	252
1738-AENTR	**2-Port EtherNet/IP Adapter** • Inlcudes 2 EtherNet/IP ports, configured as embedded switch • Supports star, tree, linear, and ring topologies • A total of 63 ArmorPoint I/O modules can be assembled on a single EtherNet/IP node • Refer to the User Manual to determine the ratings for direct and rack connections allowed	M12 Quick-Disconnect	Yes	252
		PROFIBUS DP		
1738-APB	**PROFIBUS DP I/O Adapter** • A total of 63 ArmorPoint I/O modules can be assembled on a single PROFIBUS DP node	M12 Quick-Disconnect	Yes	252

* Using the eight-point digital I/O modules.

Specifications

Cat. No.	Input Voltage Range	Field Side Power Requirements	Inrush Current	Power Consumption (W) at 24V	Power Dissipation, Max.
1738-ADN12	10…28.8V DC	400 mA at 24V DC (+20% = 28.8V DC)	6 A for 10 ms	8.0 W	2.8 W at 28.8V
1738-ADN18		400 mA at 24V DC (+20% = 28.8V DC)			
1738-ADN18P		400 mA at 24V DC (+20% = 28.8V DC)			
1738-ADNX		400 mA at 24V DC (+20% = 28.8V DC)			
1738-ACNR		425 mA @ 24V DC (+20% = 28.8V DC)			
1738-AENT		30 mA @ 24V DC (+4% = 25V DC)		4.5 W	
1738-AENTR		24V DC (+20% = 28.8 V DC max) at 400 mA max		4.5 W	
1738-APB		400 mA @ 24V DC (+20% = 28.8V DC)		8.0 W	

Mating Cables

ArmorPoint Network Adapter Mating Cables

Cat. No.	Network	Flat Media	Thick Round	Thin Round
1738-ADN12 1738-ADNX	DeviceNet	1485K-P§F5-R5	1485R-P§M5-R5	1485R-P§R5-D5
1738-ADN18P 1738-ADN18	DeviceNet	1485K-P§F5-N5	1485R-P§N5-M5	1485R-P§D5-N5
1738-ACNR	ControlNet	—	—	1786-TPST2T 1786-TPRT2T
1738-AENT	EtherNet/IP	—	—	1585D-M4DC-H
1738-AENTR				
1738-APB	PROFIBUS DP	—	—	—

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).
§ = length in meters (1, 2, 3, 4, 5, and 6 standard).
✪ = length in feet (6, 12, and 20 standard).

ArmorPoint Auxiliary Power Mating Cables

	Flat Media	Round Media	
Cat. No.	Auxiliary Power Flat Media Connection	Cordset (Single-ended)	Patchcord (Double-ended)
1738-ADN12 1738-ADNX 1738-ADN18P 1738-ADN18 1738-ACNR 1738-AENT 1738-APB	1485T-P1E4-C§-N4	889N-F4AFC-✪F	889N-F4AFNM-Θ

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).
§ = length in meters (1, 2, 3, 4, 5, and 6 standard).
✪ = length in feet (6, 12, and 20 standard).

Digital DC I/O Modules

The 1738 digital I/O modules support:

- A wide variety of voltage interface capabilities.
- Isolated and non-isolated module types.
- Point-level output fault states for short-circuit and wire-off diagnostics.
- Choice of direct-connect or rack-optimized communications.
- Field-side diagnostics on select modules.

ArmorPoint Digital DC Input Modules

General-purpose 24V DC inputs including 2- and 3-wire proximity sensors.

Cat. No.	Inputs	On-State Voltage, Nom.	Voltage Range	Input Delay Time, On to Off	Current, On-State Input, Min.	Current, On-State Input, Max.	Current, Off-State Input, Max.	PointBus Current (mA)	Power Dissipation, Max.	Termination Type
1738-IB2M12	2 Sink	24V DC	10V DC…28.8V DC	0.5 ms hardware + (0…65 ms selectable)	2 mA	5 mA	1.5 mA	75 mA	0.7 W at 28.8V DC	DC micro (M12)
1738-IB4M12	4 Sink								1.0 W at 28.8V DC	
1738-IB4DM12	4 Sink, Diagnostic		11V DC…28.8V DC	0…65535 µs selectable in 1 µs intervals (rounded to nearest 333 µs) Default is 1000 µs		15 mA		50 mA	0.6 W max at 28.8V DC	DC micro (M12)
1738-IB4M8	4 Sink		10V DC…28.8V DC	0.5 ms hardware + (0…65 ms selectable)		5 mA		75 mA	1.0 W at 28.8V DC	Pico 3-pin (M8)
1738-IB8M12	8 Sink								1.6 W at 28.8V DC	DC micro (M12)❄
1738-IB8M23									1.6 W at 28.8V DC	M23
1738-IB8M8									1.6 W at 28.8V DC	Pico 3-pin (M8)
1738-IB16DM12	16 Sink, Diagnostic								2.7 W at 28.8V DC	DC micro (M12)
1738-IV8M12	8 Source								1.6 W at 28.8V DC	DC micro (M12)
1738-IV8M23									1.6 W at 28.8V DC	M23
1738-IV8M8									1.6 W at 28.8V DC	Pico 3-pin (M8)
1738-IV4M12	4 Source								1.0 W at 28.8V DC	DC micro (M12)

❄ Quantity 4.

ArmorPoint Digital DC Output Modules

24V DC electronically protected output modules. The 1738-OB2EPM12 module has 24V DC electronically protected, fast-switching high-current outputs.

Cat. No.	Outputs	On-State Voltage, Nom.	Voltage Range	Output Current Rating, Max.	PointBus Current (mA)	Power Dissipation, Max.	Termination Type
1738-OB2EM12	2 Source	24V DC	10V DC…28.8V DC	2.0 A per module, 1.0 A per channel	75 mA	0.8 W at 28.8V DC	DC micro (M12)
1738-OB2EPM12				4.0 A per module, 2.0 A per channel			
1738-OB4EM12	4 Source			3.0 A per module, 1.0 A per channel		1.2 W at 28.8V DC	DC micro (M12)
1738-OB4EM8							Pico 3-pin (M8)
1738-OB8EM12	8 Source					2.0 W at 28.8V DC	DC micro (M12)❄
1738-OB8EM23							M23
1738-OB8EM8							Pico 3-pin (M8)
1738-OB16EM12	16 Source			4.0 A per module 0.5 A per channel	150 mA	3.0 W at 28.8V DC	DC micro (M12)
1738-OB16E25DS							D-shell✶
1738-OB16E19M23							M23
1738-OV4EM12	4 Sink			4.0 A per module, 1.0 A per channel	75 mA	2.9 W at 28.8V DC	DC micro (M12)

❄ Quantity 4.
✶ Use the 1738-CBLM25DS 25-pin D-sub connector interface cable to connect the 1738-OB16E25DS module, or another I/O module that has a similar D-sub connector, to a pneumatic valve interface.

ArmorPoint Digital DC Configurable Modules

Modules offer eight configurable 24V DC I/O points, with sealed M8 (pico) or M23 style I/O connectors. A mounting base ships with each module. The 1738-8CFGDLXM8 and 1738-8CFGDLXM23 modules include DeviceLogix functionality.

Cat. No.	Inputs/Outputs	On-State Voltage	On-State Current	PointBus Current (mA)	Power Dissipation, Max.	Termination Type
1738-8CFGM8	8 configurable sinking inputs or sourcing outputs	11V min 30V max	2 mA min 15 mA max	75 mA	1.0 W @ 28.8V DC	Pico 3-pin (M8)
1738-8CFGM23						M23
1738-8CFGDLXM8	8 configurable sinking inputs or sourcing outputs, with DeviceLogix					Pico 3-pin (M8)
1738-8CFGDLXM23						M23

ArmorPoint Digital Contact Output Modules

Individually isolated contact output modules.

Cat. No.	Outputs	On-State Voltage, Nom.	Output Delay Time, On to Off, Max.✶	Contact Resistance, Initial	Relay Output Current Rating, Max.	Leakage Current, Off-State Output, Max	PointBus Current (mA)	Power Dissipation, Max.	Termination Type
1738-OW4M12	4 Form A (N.O.) relays, isolated	24V DC	26 ms	30 mΩ	—	1.2 mA and bleed resistor thru snubber circuit @ 240V AC	80 mA	0.5 W	DC micro (M12)
1738-OW4M12AC									AC micro 4-pin§

✶ Time from valid output off signal to relay deenergization by module.
§ Quantity 2.

Mating Cables

ArmorPoint Digital DC Input Module Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738-IB8M12 1738-IV8M12 1738-IB16DM12	(2) DC Micro	879D-F4ACDM—*	879D-C3ACD4M—‡	871A-VS4-DM
	(2) Pico 3-Pin	879PZ-F3ABDM4—*		
	(2) Pico 4-Pin	879PZ-F4ABDM—*		
	(1) DC Micro	889D-F4ACDM—*	889D-M4AC—‡	871A-TS4-DM
	(1) Pico 3-Pin	889P-F3ABDM4—*		
	(1) Pico 4-Pin	889P-F4ABDM—*		
1738-IB2M12 1738-IB4M12 1738-IB4DM12 1738-IV4M12	(1) DC Micro	889D-F4ACDM—*	889D-M4AC—‡	871A-TS4-DM
	(1) Pico 3-Pin	889P-F3ABDM4—*		
	(1) Pico 4-Pin	889P-F4ABDM—*		
1738-IB4M8 1738-IB8M8 1738-IV8M8 1738-8CFGM8 1738-8CFGDLXM8	(1) DC Micro	889D-F4ABP3M—*	889P-M3AB—‡	871A-TS3-PM
	(1) Pico 3-Pin	889P-F3ABPM—*		
	(1) Pico 4-Pin	889P-F4ABPM3—*		
1738-IB8M23 1738-IV8M23 1738-8CFGM23 1738-8CFGDLXM23	(1) M23 12-Pin	889M-F11RMMU—*	889M-U11RM—‡	889M-M12AH-T

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

ArmorPoint Digital DC Output Module Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738-OB8EM12 1738-OB16EM12	(2) DC Micro	879D-F4ACDM—Θ	879D-C3ACD4M—‡	871A-VS4-DM
	(2) Pico 3-Pin	879PZ-F3ABDM4—Θ		
	(2) Pico 4-Pin	879PZ-F4ABDM—Θ		
	(1) DC Micro	889D-F4ACDM—Θ	889D-M4AC—‡	871A-TS4-DM
	(1) Pico 3-Pin	889P-F3ABDM4—Θ		
	(1) Pico 4-Pin	889P-F4ABDM—Θ		
1738-OB2EM12 1738-OB2EP12 1738-OB4EM12 1738-OV4EM12	(1) DC Micro	889D-F4ACDM—Θ	889D-M4AC—‡	871A-TS4-DM
	(1) Pico 3-Pin	889P-F3ABDM4—Θ		
	(1) Pico 4-Pin	889P-F4ABDM—Θ		
1738-OB4EM8 1738-OB8EM8	(1) DC Micro	889D-F4ABP3M—Θ	889P-M3AB—‡	871A-TS3-PM
	(1) Pico 3-Pin	889P-F3ABPM—Θ		
	(1) Pico 4-Pin	889P-F4ABPM3—Θ		
1738-OB8EM23	(1) M23 12-Pin	889M-F11RMMU—Θ	889M-U11RM—‡	889M-M12AH-T
1738-OB16E19M23	(1) M23 19-Pin	889M-F19RM—Θ	889M-U19RM—‡	889M-M19AH-T

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

ArmorPoint Digital Contact Output Module Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738-OW4M12	(1) DC Micro	889D-F4ACDM—Θ	889D-M4AC—‡	871A-TS4-DM
1738-OW4M12AC	(1) AC Micro 4-Pin	889R-F4AERM—Θ	889R-M4AEA—‡	—

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

ArmorPoint Digital Contact Output Module Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738-OW4M12	(1) DC Micro	889D-F4ACDM—Θ	889D-M4AC—‡	871A-TS4-DM
1738-OW4M12AC	(1) AC Micro 4-Pin	889R-F4AERM—Θ	889R-M4AEA—‡	—

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

Digital AC I/O Modules

The 1738 digital I/O modules support:

- A wide variety of voltage interface capabilities.
- Isolated and non-isolated module types.
- Point-level output fault states for short-circuit and wire-off diagnostics.
- Choice of direct-connect or rack-optimized communications.
- Field-side diagnostics on select modules.

ArmorPoint Digital AC Input Modules

General-purpose AC inputs including 2- and 3-wire proximity sensors.

Cat. No.	Inputs	On-State Voltage, Nom.	Voltage Range	Input Delay Time, On to Off	Current, On-State Input, Min.	Current, Off-State Input, Max.	Input Impedance, Nom.	PointBus Current (mA)	Power Dissipation, Max.	Termination Type
1738-IA2M12AC3	2	120V AC	65V AC…132V AC	20.0 ms hardware + (0…65 ms selectable)	3.7 mA	2.5 mA	10.6 kΩ	75mA	0.7 W at 132V AC	AC micro 3-pin❄
1738-IA2M12AC4										AC micro 4-pin❄

❄ Quantity 2.

ArmorPoint Digital AC Output Modules

General purpose AC outputs.

Cat. No.	Outputs	On-State Voltage, Nom.Voltage, On-State Output, Nom.	Voltage Range	Output Current Rating	PointBus Current (mA)	Power Dissipation, Max.	Termination Type
1738-OA2M12AC3	2	120V/220V AC	74V AC…264V AC	1.5 A (2 channels @ 0.75 A each)	75 mA	0.8 W at 28.8V DC	AC 3-pin❄

❄ Quantity 2.

Mating Cables

ArmorPoint Digital AC Input Module Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738-IA2M12AC3	(1) AC Micro 3-Pin	889R-F3AERM—Θ	889R-M3AEA—‡	871A-TS3-RM
1738-IA2M12AC4	(1) AC Micro 4-Pin	889R-F4AERM—Θ	889R-M4AEA—‡	—

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

ArmorPoint Digital AC Output Module Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738-OA2M12AC3	(1) AC Micro 3-Pin	889R-F3AERM—Θ	889R-M3AEA—‡	871A-TS3-RM

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

Temperature and RTD Input Modules—Additional Specifications

	1738-IR2M12	1738-IT2IM12
Number of Inputs	2 single-ended RTD	2 single-ended Isolated Thermocouple, Millivolt
Thermocouple Resolution	—	Type B, 30…1820° C, 3 counts/ °C Type C, 0…2315° C, 6 counts/ °C Type E, -270…1000° C, 24 counts/ °C Type J, -210…1200° C, 21 counts/ °C Type K, -270…1372° C, 13 counts/ °C Type N, -270…1300° C, 11 counts/ °C Type R, -50…1768.1° C, 4 counts/ °C Type S, -50...1768.1° C, 4 counts/ °C Type T, -270…400° C, 15 counts/ °C
Cold Junction Compensation Range	—	0…70 °C
Input Update Rate, per Module	20 ms @ Notch = 50 Hz 17 ms @ Notch = 60 Hz (default) 10 ms @ Notch = 100 Hz 8 ms @ Notch = 120 Hz 5 ms @ Notch = 200 Hz 4 ms @ Notch = 240 Hz 3 ms @ Notch = 300 Hz 3 ms @ Notch = 400 Hz 2 ms @ Notch = 480 Hz	20 ms @ Notch = 50 Hz 17 ms @ Notch = 60 Hz (default) 10 ms @ Notch = 100 Hz 8 ms @ Notch = 120 Hz 5 ms @ Notch = 200 Hz 4 ms @ Notch = 240 Hz 3 ms @ Notch = 300 Hz 3 ms @ Notch = 400 Hz 2 ms @ Notch = 480 Hz
Data Format	Signed integer	Signed integer

ArmorPoint Analog Output Modules

Cat. No.	Outputs	Output Signal Range	Output Resolution	Absolute Accuracy	Step Response to 63% of FS	Output Conversion Rate	PointBus Current (mA)	External DC Supply Current, Nom.	Power Dissipation, Max.	Termination Type
1738-OE2CM12	2 single-ended	4…20 mA 0…20 mA	13 bits - over 21 mA 2.5 µA/cnt	0.1% Full Scale at 25° C∗ ❄0.1% Full Scale at 25 °C	24 µs	16 µs	75 mA	50 mA at 24V DC (including outputs at 20 mA)	1.0 W at 28.8V DC	DC Micro (M12)
1738-OE4CM12	4 single-ended	0 mA output until communication established 0…21 mA user configurable	16 bits 0.32 µA/cnt		40 µs	1 µs		115 mA at 24V DC (including outputs at 20 mA)	750 Ω load on each output: 1.86 W at 28.8V DC 0 Ω load on each output: 2.15 W at 28.8V DC	
1738-OE2VM12	2 single-ended	0…10V ±10V	14 bits (13 + sign) 1.28 mV/cnt in unipolar or bipolar mode		20 µs	20 µs		35 mA at 24V DC (including outputs at 3 mA)	1.0 W at 28.8V DC	

∗ Includes offset, gain, non-linearity, and repeatability error terms.
❄ Analog output modules support these configurable parameters and diagnostics: open-wire with LED and electronic reporting (OE2C only); fault mode; idle mode; alarms; channel signal range and on-board scaling.

Mating Cables

The mating cables listed represent straight PVC models. You can also use our Product Configuration Assistant http://raise.rockwellautomation.com/RAConfig/configure.asp?tid=1738AIO for ArmorPoint analog I/O modules to find additional mating cables, network connections, and auxiliary power connections for the I/O module you need.

ArmorPoint Analog Input Module Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738-IE2CM12 1738-IE4CM12 1738-IE2VM12 1738-IR2M12	(1) DC Micro	889D-F4SCDM—Θ	889D-M4SC—‡	889D-M4DC-SH
1738-IT2IM12	(1) DC Micro	—	—	871A-TS4CJC-DM

ArmorPoint Analog Output Module Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738-OE2CM12 1738-OE4CM12 1738-OE2VM12	(1) DC Micro	889D-F4SCDM—Θ	889D-M4SC—‡	889D-M4DC-SH

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

Specialty I/O Modules

- Counter Modules
- SSI Modules
- Serial Interface Modules (RS–232, RS–485, RS–422)

ArmorPoint Counter Modules

The input voltage range is 5V DC (1738–IJ) or 15…24V DC (1738–VHSC24). The module returns the count or frequency in the form of a 24-bit binary number (0…16,777,215) expressed in a 32-bit word. Each counter has a user-selectable preset and rollover value associated with it.

The operation of the counter and encoder modes is nearly identical. The difference between the two modes is in the type of feedback (one-phase versus two-phase) for the count direction (up or down). In encoder mode, a transition is expected on B for counting to proceed in a direction, whereas, in counter mode, the B input may be left at a static level. All operating modes are selected by writing appropriate configuration data to the module.

Cat. No.	Number of Counters	Voltage, On-State Input, Nom.	Field Power Bus	Number of Compare Windows	Output Groups	Input Frequency, Max.	Output Delay Time, Off to On	Current, On-State Input, Min.	PointBus Current (mA)	Termination Type
1738-IJM23	1	5V DC	Voltage dependent on field power source✶	—	—	1.0 MHz counter and encoder X1 configurations (no filter) 500 kHz encoder X2 configuration (no filter) 250 kHz encoder X4 configuration (no filter)	—	≥5 mA	160	M23
1738-VHSC24M23	1	24V DC		4	1 group of 2		25 µs (load dependent) ❄		110	M23

✶ Field power source via the field power connection on the network adapter, 1738–EP24DC, or 1738–FPD.
❄ OFF to ON delay is time from a valid output “on” signal to output energization.

ArmorPoint Serial I/O Modules

ArmorPoint Synchronous Serial Interface Modules

The Synchronous Serial Interface Absolute Encoder Module collects serial data from industrial absolute position encoding sensors that use standard SSI protocol, including linear, rotary, and optical distance measuring devices. The module is inserted into an ArmorPoint I/O terminal base that provides common power, communications, and wiring connections for the SSI sensors. The module converts a serial data stream from an SSI sensor into absolute position data readable as a 32-hexadecimal value. Gray or binary-code capable with gray to binary conversion, increasing or decreasing SSI count indication, 2 SSI word comparator values, and SSI word latching with I1 input.

ArmorPoint Serial Interface Modules

The 1738–232ASCM12 and 1738–485ASCM12 serial-interface modules offer a serial-link communication interface solution for peripheral products with RS–232 (use the 1738–232ASCM12), RS–485, and RS–422 ports (use the 1738–485ASCM12). These modules allow a device with serial-interface output (i.e., bar code readers) to communicate up to 128 bytes of ASCII data onto any network supported by ArmorPoint I/O. Each module is a single-channel, full-duplex interface and is rated for up to 38.4k baud. LED indicators on the modules offer diagnostics for the module, POINTBus backplane, and transmit/receive status indication.

ArmorPoint Serial I/O Modules

Cat. No.	Inputs/Outputs	PointBus Current (mA)	External DC Power Supply	Power Dissipation, Max.	Termination Type
1738-SSIM23	1 Synchronous Serial Interface channel	110 mA	10…28V DC 0.75 A max.	0.94 W	M23
1738-232ASCM12	1 Serial Interface channel, RS232	75 mA	10…28.8V DC 1.0 A max.	1.75 W at 28.8V DC	DC Micro (M12)
1738-485ASCM12	1 Serial Interface channel, RS485, RS422	75 mA	10…28.8V DC 1.0 A max.	1.75 W at 28.8V DC	

Mating Cables

The mating cables shown represent straight PVC models. You can also use our Product Configuration Assistant http://raise.rockwellautomation.com/RAConfig/configure.asp?tid=1738SIO for ArmorPoint specialty I/O modules to find additional mating cables, network connections, and auxiliary power connections for the I/O module you need.

ArmorPoint Counter Modules Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738-IJM23 1738-VHSC24M23	(1) M23 12-pin	889D-F4SCDM—Θ	889D–M4SC—‡	889D-M4DC-SH

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

ArmorPoint Serial I/O Mating Cables

ArmorPoint Cat. No.	End Device per Connector	Recommended Patchcord (Double-ended)	Recommended Male Cordset (Single-ended)	Recommended Field Attachable Connector
1738–SSIM23	(1) M23 12-Pin	—	—	889M–M12AH–T
1738–232ASCM12 1738–485ASCM12	(1) DC Micro	889D–F4SCDM—Θ	889D–M4SC—‡	889D–M4DC–SH

Θ = length in meters (1, 2, 3, 5, and 10 standard).
‡ = length in meters (2, 5, and 10 standard).

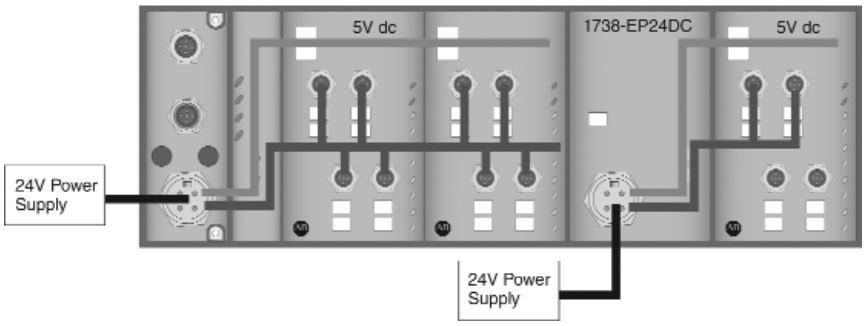
ArmorPoint Expansion Power Unit

The ArmorPoint I/O Expansion Power Unit (1738–EP24DC) passes 24V DC field power to the I/O modules to the right of it. This unit extends the backplane bus power and creates a new field voltage partition segment for driving field devices for up to 17 I/O modules. The expansion power unit separates field power from I/O modules to the left of the unit, effectively providing functional and logical partitioning for:

- Separating field power between input and output modules
- Separating field power to the analog and digital modules
- Grouping modules to perform a specific task or function

Power to the POINTBus backplane and I/O modules is brought in through the auxiliary power connector. You can connect up to 12 I/O modules and an adapter with a maximum of 10 A field power, using the auxiliary power. Additional I/O modules require the use of one or more ArmorPoint I/O 24V DC expansion power units.

ArmorPoint I/O System with 24V dc Expansion Power Unit (1738-EP24DC)

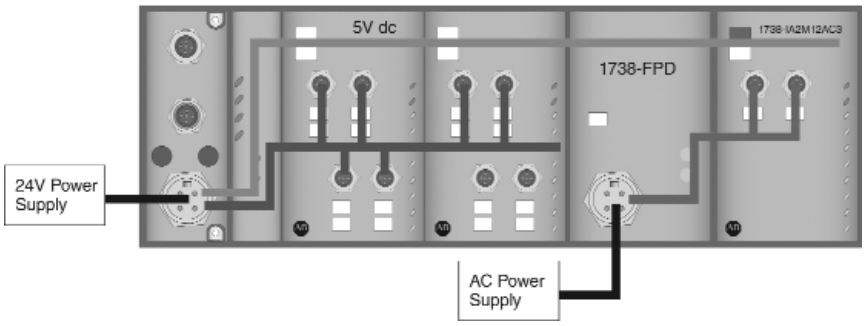


The auxiliary power supports up to 17 I/O modules and an adapter with a maximum of 10 A field power. The 24V DC expansion power unit (1738-EP24DC) extends the backplane bus power to support up to 17 more I/O modules. Connect additional expansion power units to expand the I/O assembly up to the maximum of 63 I/O modules.

ArmorPoint Field Power Distributor

The ArmorPoint I/O Field Power Distributor Module (1738-FPD) passes through all ArmorPoint I/O backplane signals, but does not provide additional POINTBus backplane power. The field power distributor gives you the ability to change the field power distribution source for I/O modules to the right of the field power distributor. This facilitates logical or functional partitioning of low-channel count, high I/O mix applications using any of the communication adapters. Use the field power distributor with a broad range of voltage inputs including 5V DC to 250V DC and/or 24V AC to 240V AC applications and I/O modules.

ArmorPoint I/O System with Field Power Distributor (1738-FPD)



The ArmorPoint field power distributor (1738-FPD) discontinues the I/O circuit power bus in order to change the field power source for I/O modules to the right of it. This allows a broad range of voltage inputs in the I/O assembly.

Specifications

Cat. No.	Power Input Voltage Range	Field Side Power Requirements	Inrush Current, Max.	PointBus Output Current Rating	Power Consumption, Max.
1738-EP24DC	10…28.8V DC	400 mA @ 24V DC (+20% = 28.8V DC)	6 A for 10 ms	1.3 A	9.8 W @ 28.8V DC
1738-FPD	5…150V DC 24…240V AC	—	—	—	—

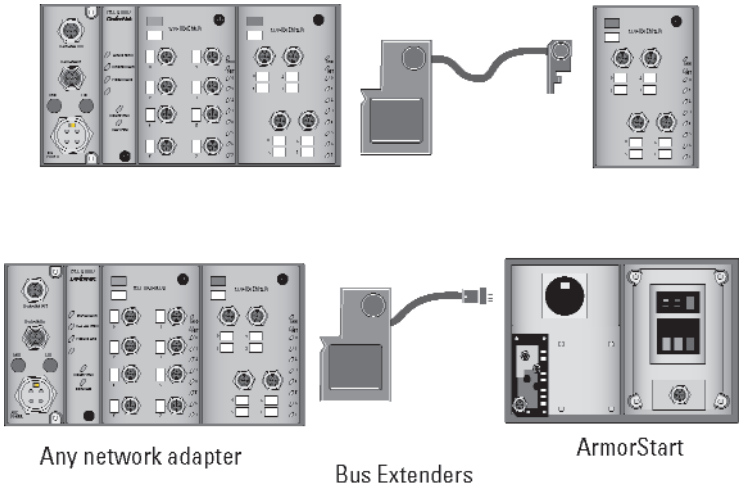
Accessories

ArmorPoint 25-pin D-sub Connector Interface Cable

Cat. No.	Description
1738-CBL3M25DS	ArmorPoint 1 m (3.28 ft) cable assembly with 25-pin D-sub male connector. The other end of the cable consists of loose wires for connecting to a pneumatic valve interface. Compatible with 1738-OB16E25DS module.

Bus Extension Bases (1738-EXT1, 1738-EXT3)

An ArmorPoint I/O bus extension base allows the backplane to be extended to additional I/O or the ArmorStart IP 67 motor starter. May require the addition of an auxiliary power module. Refer to the installation manual (publication 1738–IN018A) to determine if a 1738–EP24DC or 1738–FPD is needed after a bus extension base.



ArmorPoint Bus Extension Bases

Cat. No.	Description
1738-EXT1	ArmorPoint 1 meter bus extension base
1738-EXT3	ArmorPoint 3 meter bus extension base

ArmorPoint to ArmorStart Bus Extension Bases

Cat. No.	Description
280A-EXT1	ArmorPoint to ArmorStart 1 meter bus extension base